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Joseph C. Makarewicz

The College at Brockport, jmakarew@brockport.edu

Matthew J. Nowak

The College at Brockport

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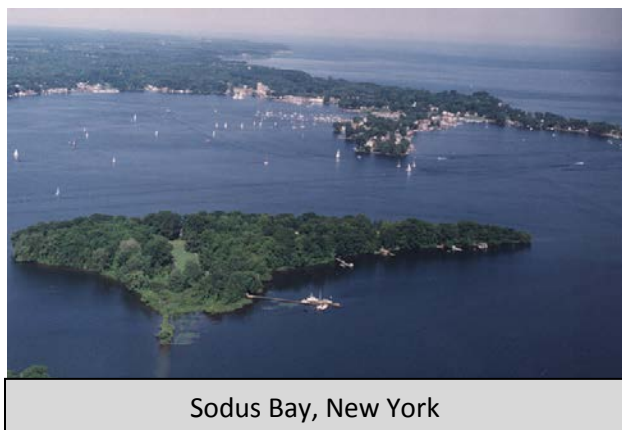
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Sodus Bay Wayne County, New York

Joseph C. Makarewicz and Matthew J. Nowak
The College at Brockport, State University of New York
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Sodus Bay is one of Lake Ontario's major embayments separated from the lake by a 7,500-foot long barrier beach. The bay is located in Wayne County, New York, and is 4.4 miles in length



Sodus Bay, New York

and 2.4 miles across. This major point of access to Lake Ontario contains 12 marinas, 13 waterfront restaurants, 2 public access sites, a public beach, and a sailing school. The 46-mi² Sodus Bay watershed is composed of land that is 30% agriculture, 4% developed land, 61% forest, and 4% wetlands. First Creek, Second Creek, Third Creek, Sodus Creek West, Sodus Creek East (Glenmark Creek), and Clark Creek empty into this bay. Sodus Bay has nuisance algae and macrophytes which can cause beach closings. This short

report provides a synopsis of data collected monthly from May through September (2003 to 2009) on the water quality of Sodus Bay and the lakeside (swimmable depth) of Lake Ontario near the bay.

Phosphorus is of concern as it stimulates the growth of plants, causing blooms of algae such as *Cladophora*. Both lakeside and creek total phosphorus (TP) levels exceeded the NYSDEC ambient guideline of 20 µg P/L for phosphorus concentration. Average TP levels (Fig. 1a) in the lakeside waters (43.9 ± 10.4 µg P/L) were slightly higher than Sodus Bay concentrations (33.2 ± 5.3 µg P/L) while bay soluble reactive phosphorus (SRP) levels (6.6 ± 0.9 µg P/L) were similar to lakeside concentrations (7.6 ± 3.4 µg P/L). Average annual TP concentrations in the lakeside waters (Fig. 1a) had no clear annual trends but occasionally increased in lakeshore waters to levels much higher than those found within Sodus Bay itself. In comparison to TP concentrations in other Lake Ontario bays (129.7 ± 59.6 µg P/L), average TP concentrations in Sodus Bay (33.2 ± 5.3 µg P/L) were lower, while the nearby lakeside waters (43.9 ± 10.4 µg P/L) had a similar value. The bay and lakeside water TP concentrations were much higher than those in the open (9.5 ± 0.7 µg P/L) offshore waters of Lake Ontario. Summer averages of algae (indicated by *chlorophyll a*, Fig. 1c), phycocyanin (Fig. 1d), an indicator of the nuisance species of blue-green algae, suspended sediment (TSS, Fig. 1e), and total Kjeldahl nitrogen (Fig. 1g) had no clear trends but had occasional increases in lakeshore water levels similar to those observed in TP concentrations (Fig. 1a). Nitrate levels (Fig. 1f) were consistently higher in lakeshore waters than within Sodus Bay. Seasonally, lakeside total phosphorus (Fig. 2a), phycocyanin (Fig. 2d), TSS (Fig. 2e), and TKN concentrations (Fig. 2g) peaked in July. Soluble reactive phosphorus levels (Fig. 2b), as well as chlorophyll levels (Fig. 2c) peaked in June. In the bay, TP, SRP, phycocyanin, nitrate, and TKN concentrations peaked in July and September (Fig. 3).

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Table 1. Average concentrations (2003 to 2009, May through September) and standard errors (S.E.) of total phosphorus (TP), soluble reactive phosphorus (SRP), nitrate, Chlorophyll a (Chl a), phycocyanin, total suspended solids (TSS), total Kjeldahl nitrogen (TKN), sodium, and silica.

	TP ($\mu\text{g P/L}$)		SRP ($\mu\text{g P/L}$)		Nitrate (mg/L)		Chlorophyll ($\mu\text{g/L}$)		Phycocyanin ($\mu\text{g/L}$)		TSS (mg/L)		TKN ($\mu\text{g/L}$)		Sodium (mg/L)		Silica (mg/L)	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
Lakeside	62.0	7.4	7.0	0.9	0.27	0.01	19.1	4.1	17.8	2.2	33.5	4.8	795	96	13.78	0.19	0.56	0.06
Rivers	83.8	7.0	44.8	5.4	0.57	0.03	6.5	0.8	13.2	3.0	10.5	1.9	559	25	26.65	1.28	1.42	0.15
Embayments	129.7	59.6	15.5	2.0	0.14	0.01	20.0	2.4	237.5	207.6	17.0	5.70	923	70	27.47	1.49	1.29	0.11
Lake Ontario 30m	9.9	0.7	3.1	0.5	0.31	0.02	2.0	0.17	5.5	1.2	0.7	0.14	253.3	21.0	11.46	0.23	0.35	0.05
Lake Ontario 100m	9.5	0.7	5.2	2.1	0.31	0.01	2.6	0.26	6.1	1.3	0.8	0.12	343.4	50.9	11.45	0.24	0.40	0.07

Map of the “North Coast” of New York showing sampling locations for the Lake Ontario Coastal Initiative. Sodus Bay watershed is shown in the insert.

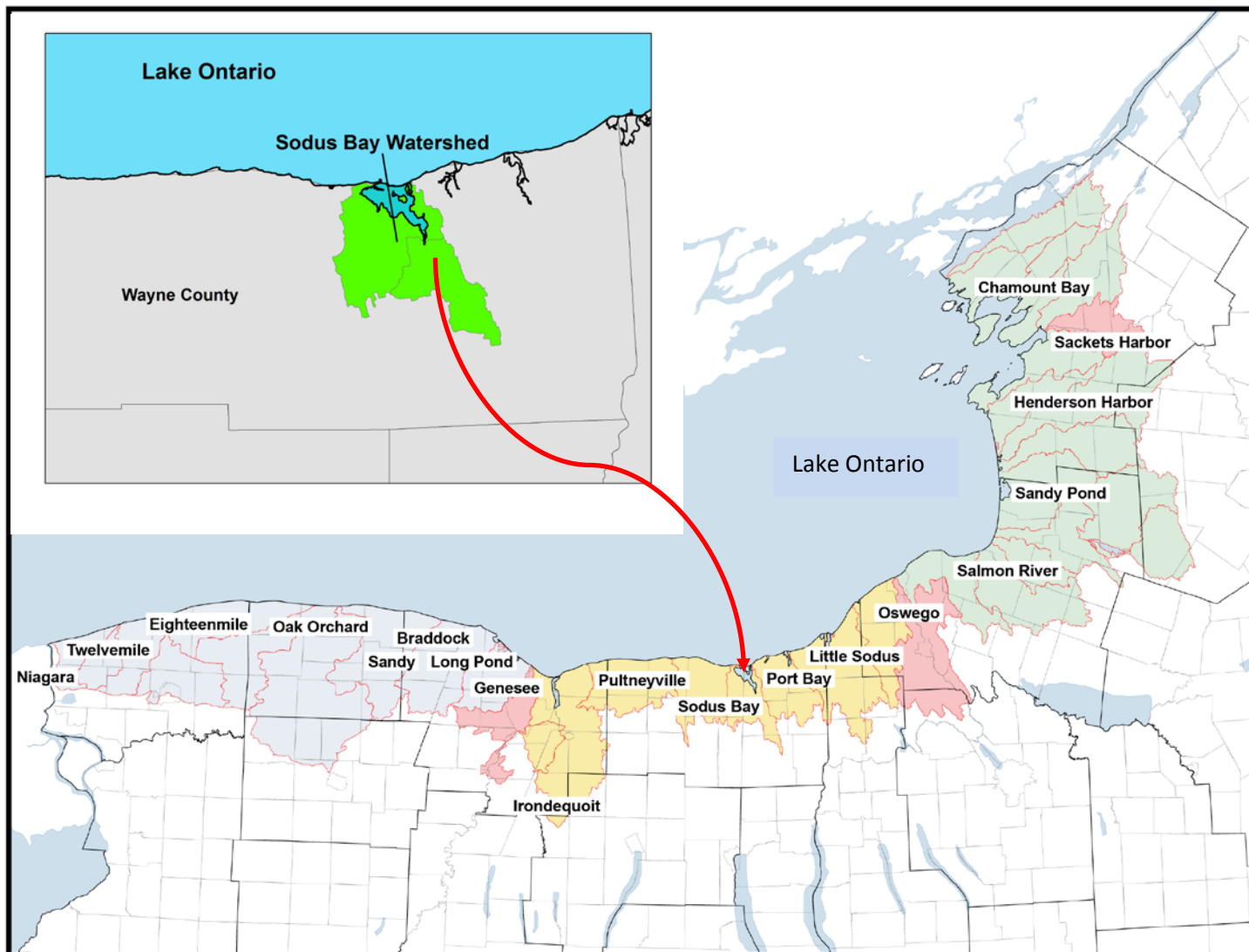


Figure 1. Average (\pm S.E) summer total phosphorus, soluble reactive phosphorus, chlorophyll a, phycocyanin, total suspended solids, nitrate, and total Kjeldahl nitrogen concentrations at the lakeside of Lake Ontario near Sodus Bay and at Sodus Bay. Surface water samples were taken monthly (May-September) at a 1-meter depth.

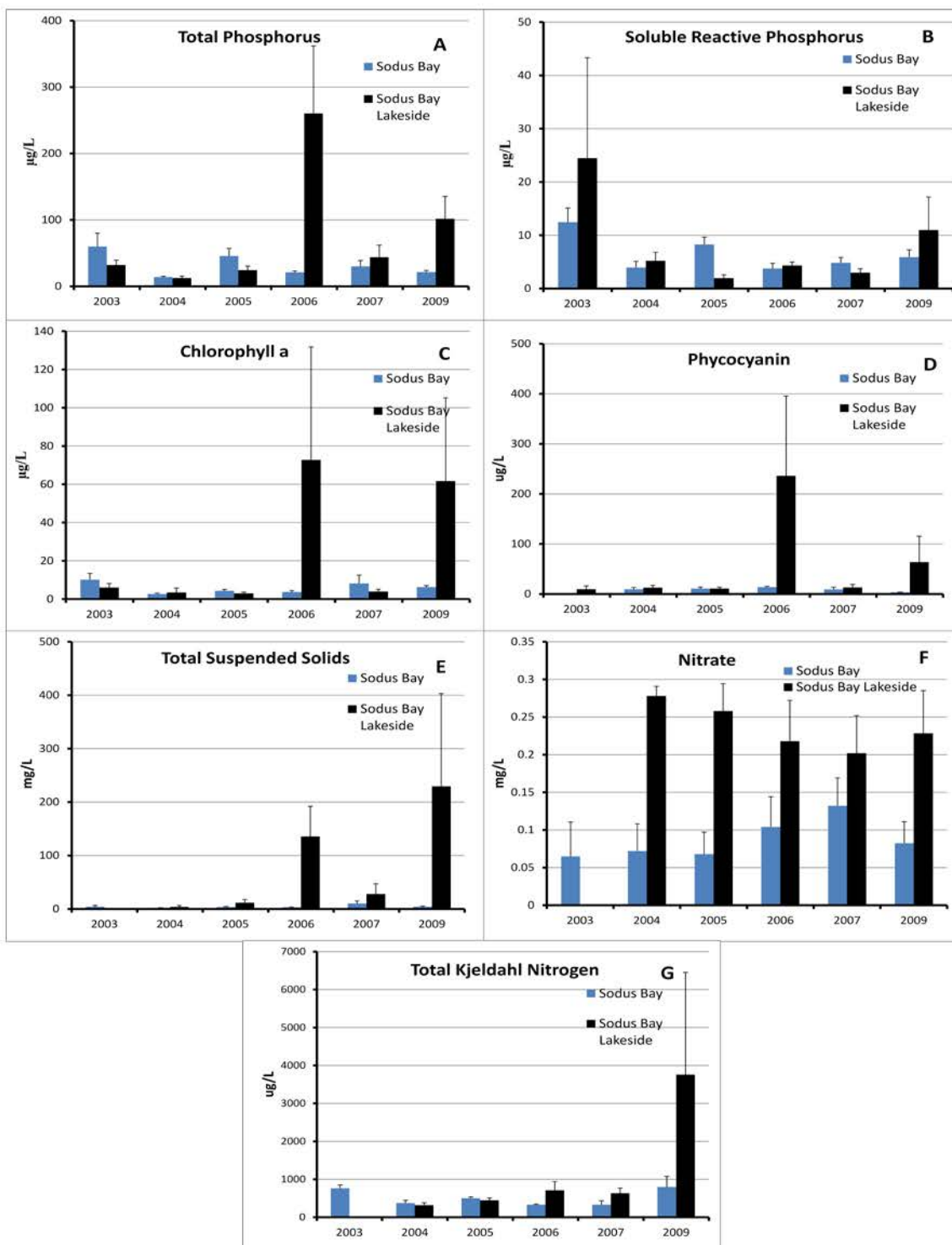


Figure 2. Average (\pm S.E) seasonal concentrations of total phosphorus, soluble reactive phosphorus, chlorophyll a, phycocyanin, total suspended solids, nitrate, and total Kjeldahl nitrogen at the lakeside of Lake Ontario near Sodus Bay.

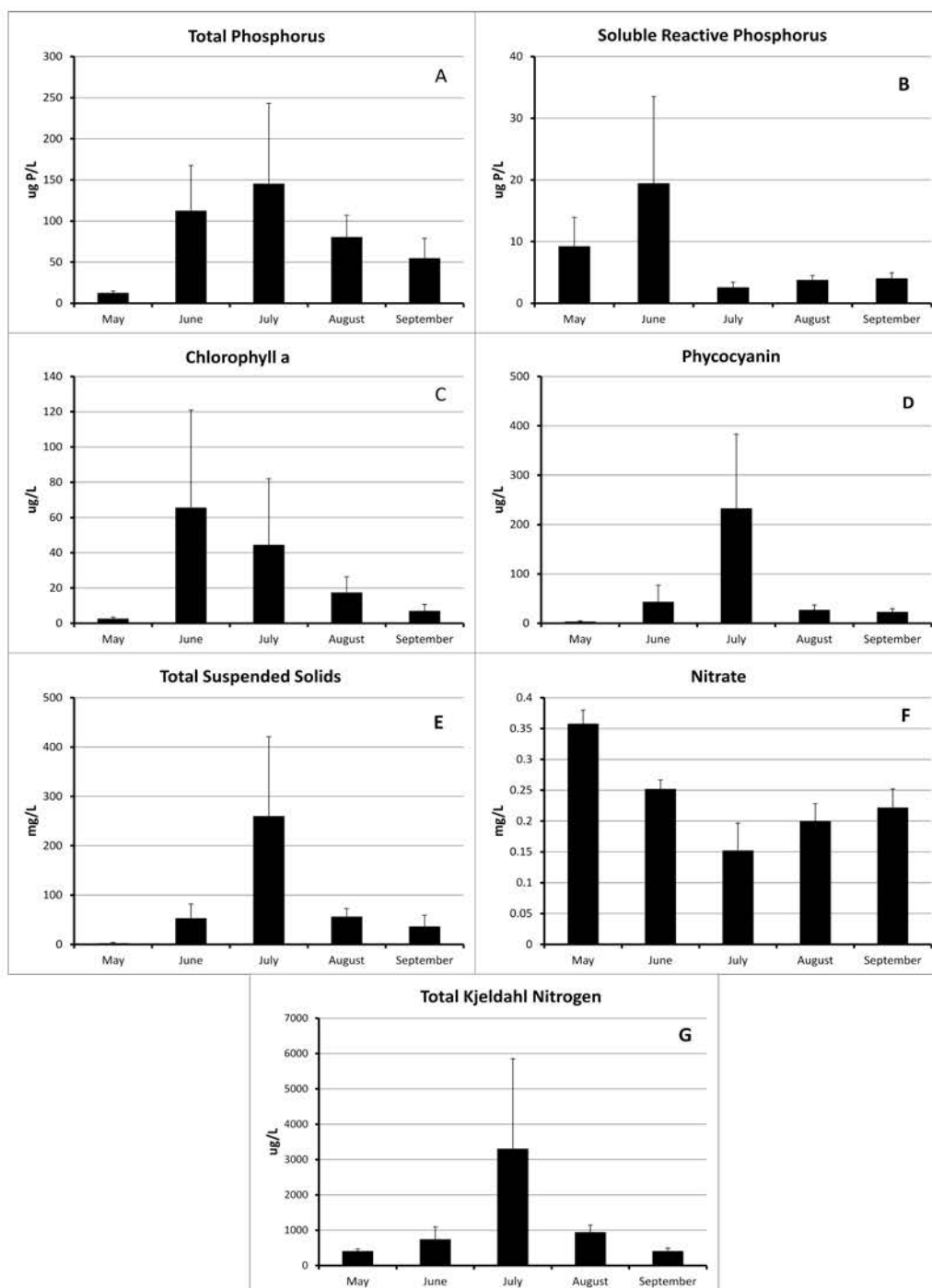


Figure 3. Average (\pm S.E) seasonal concentrations of total phosphorus, soluble reactive phosphorus, chlorophyll a, phycocyanin, total suspended solids, nitrate, and total Kjeldahl nitrogen in Sodus Bay.

